

SEQUENCE LISTING

<110> GOLDBERG, EDWARD B.

<120> GENE AND PROTEIN SEQUENCES OF PHAGE T4 GENE 35

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<140> PCT/US99/13024

<141> 1999-06-11

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<170> PatentIn Ver. 2.0

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	705					710					715				720
Ser	Val	Val	Ala	Leu	Ser	Gly	Leu	Val	Glu	Ser	Gly	Thr	Leu	Trp	Asp
			725						730					735	
His	Tyr	Thr	Leu	Asn	Ile	Leu	Glu	Ala	Asn	Glu	Thr	Gln	Arg	Gly	Thr
			740					745					750		
Leu	Arg	Val	Ala	Thr	Gln	Val	Glu	Ala	Ala	Ala	Gly	Thr	Leu	Asp	Asn
		755					760					765			
Val	Leu	Ile	Thr	Pro	Lys	Lys	Leu	Leu	Gly	Thr	Lys	Ser	Thr	Glu	Ala
	770					775					780				
Gln	Glu	Gly	Val	Ile	Lys	Val	Ala	Thr	Gln	Ser	Glu	Thr	Val	Thr	Gly
	785					790					795				800
Thr	Ser	Ala	Asn	Thr	Ala	Val	Ser	Pro	Lys	Asn	Leu	Lys	Trp	Ile	Ala
			805						810					815	
Gln	Ser	Glu	Pro	Thr	Trp	Ala	Ala	Thr	Thr	Ala	Ile	Arg	Gly	Phe	Val
			820					825					830		
Lys	Thr	Ser	Ser	Gly	Ser	Ile	Thr	Phe	Val	Gly	Asn	Asp	Thr	Val	Gly
		835					840					845			
Ser	Thr	Gln	Asp	Leu	Glu	Leu	Tyr	Glu	Lys	Asn	Ser	Tyr	Ala	Val	Ser
	850					855					860				
Pro	Tyr	Glu	Leu	Asn	Arg	Val	Leu	Ala	Asn	Tyr	Leu	Pro	Leu	Lys	Ala
	865					870					875				880
Lys	Ala	Ala	Asp	Thr	Asn	Leu	Leu	Asp	Gly	Leu	Asp	Ser	Ser	Gln	Phe
			885						890					895	
Ile	Arg	Arg	Asp	Ile	Ala	Gln	Thr	Val	Asn	Gly	Ser	Leu	Thr	Leu	Thr
			900					905					910		
Gln	Gln	Thr	Asn	Leu	Ser	Ala	Pro	Leu	Val	Ser	Ser	Ser	Thr	Gly	Glu
		915					920						925		

Phe Gly Gly Ser Leu Ala Ala Asn Arg Thr Phe Thr Ile Arg Asn Thr
930 935 940
Gly Ala Pro Thr Ser Ile Val Phe Glu Lys Gly Pro Ala Ser Gly Ala
945 950 955 960
Asn Pro Ala Gln Ser Met Ser Ile Arg Val Trp Gly Asn Gln Phe Gly
965 970 975
Gly Gly Ser Asp Thr Thr Arg Ser Thr Val Phe Glu Val Gly Asp Asp
980 985 990
Thr Ser His His Phe Tyr Ser Gln Arg Asn Lys Asp Gly Asn Ile Ala
995 1000 1005
Phe Asn Ile Asn Gly Thr Val Met Pro Ile Asn Ile Asn Ala Ser Gly
1010 1015 1020
Leu Met Asn Val Asn Gly Thr Ala Thr Phe Gly Arg Ser Val Thr Ala
1025 1030 1035 1040
Asn Gly Glu Phe Ile Ser Lys Ser Ala Asn Ala Phe Arg Ala Ile Asn
1045 1050 1055
Gly Asp Tyr Gly Phe Phe Ile Arg Asn Asp Ala Ser Asn Thr Tyr Phe
1060 1065 1070
Leu Leu Thr Ala Ala Gly Asp Gln Thr Gly Gly Phe Asn Gly Leu Arg
1075 1080 1085
Pro Leu Leu Ile Asn Asn Gln Ser Gly Gln Ile Thr Ile Gly Glu Gly
1090 1095 1100
Leu Ile Ile Ala Lys Gly Val Thr Ile Asn Ser Gly Gly Leu Thr Val
1105 1110 1115 1120
Asn Ser Arg Ile Arg Ser Gln Gly Thr Lys Thr Ser Asp Leu Tyr Thr
1125 1130 1135
Arg Ala Pro Thr Ser Asp Thr Val Gly Phe Trp Ser Ile Asp Ile Asn
1140 1145 1150
Asp Ser Ala Thr Tyr Asn Gln Phe Pro Gly Tyr Phe Lys Met Val Glu
1155 1160 1165
Lys Thr Asn Glu Val Thr Gly Leu Pro Tyr Leu Glu Arg Gly Glu Glu
1170 1175 1180
Val Lys Ser Pro Gly Thr Leu Thr Gln Phe Gly Asn Thr Leu Asp Ser
1185 1190 1195 1200
Leu Tyr Gln Asp Trp Ile Thr Tyr Pro Thr Thr Pro Glu Ala Arg Thr
1205 1210 1215
Thr Arg Trp Thr Arg Thr Trp Gln Lys Thr Lys Asn Ser Trp Ser Ser
1220 1225 1230
Phe Val Gln Val Phe Asp Gly Gly Asn Pro Pro Gln Pro Ser Asp Ile
1235 1240 1245
Gly Ala Leu Pro Ser Asp Asn Ala Thr Met Gly Asn Leu Thr Ile Arg
1250 1255 1260
Asp Phe Leu Arg Ile Gly Asn Val Arg Ile Val Pro Asp Pro Val Asn
1265 1270 1275 1280

Lys Thr Val Lys Phe Glu Trp Val Glu
1285

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<211> 65
<212> PRT
<213> Bacteriophage T4

<400> 5
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1 5 10 15
Ile Leu Ser Glu Ser Asn Ser Val Arg Tyr Lys Ile Ser Ile Ala Gly
20 25 30
Ser Cys Pro Leu Ser Thr Ala Gly Pro Ser Tyr Val Lys Phe Gln Asp
35 40 45
Asn Pro Val Gly Ser Gln Thr Phe Arg Arg Arg Pro Ser Phe Lys Ser
50 55 60
Phe
65

<210> 6
<211> 295
<212> PRT
<213> Bacteriophage T4

<400> 6
Met Leu Phe Arg Leu Gln Met Ile Leu His Gln Leu Leu Leu Leu Val
1 5 10 15
Phe Met Asn Ser Leu Thr Asn Asn Arg Ile Val Ala Ile Leu Thr Ser
20 25 30
Gly Lys Val Asn Phe Pro Pro Glu Val Val Ser Trp Leu Arg Thr Ala
35 40 45
Gly Thr Ser Ala Phe Pro Ser Asp Ser Ile Leu Ser Arg Phe Asp Val
50 55 60
Ser Tyr Ala Ala Phe Tyr Thr Ser Ser Lys Arg Ala Ile Ala Leu Glu
65 70 75 80
His Val Lys Leu Ser Asn Arg Lys Ser Thr Asp Asp Tyr Gln Thr Ile
85 90 95
Leu Asp Val Val Phe Asp Ser Leu Glu Asp Val Gly Ala Thr Gly Phe
100 105 110
Pro Arg Arg Thr Tyr Glu Ser Val Glu Gln Phe Met Ser Ala Val Gly
115 120 125
Gly Thr Asn Asn Glu Ile Ala Arg Leu Pro Thr Ser Ala Ala Ile Ser
130 135 140
Lys Leu Ser Asp Tyr Asn Leu Ile Pro Gly Asp Val Leu Tyr Leu Lys
145 150 155 160
Ala Gln Leu Tyr Ala Asp Ala Asp Leu Leu Ala Leu Gly Thr Thr Asn
165 170 175

Ile Ser Ile Arg Phe Tyr Asn Ala Ser Asn Gly Tyr Ile Ser Ser Thr
 180 185 190
 Gln Ala Glu Phe Thr Gly Gln Ala Gly Ser Trp Glu Leu Lys Glu Asp
 195 200 205
 Tyr Val Val Val Pro Glu Asn Ala Val Gly Phe Thr Ile Tyr Ala Gln
 210 215 220
 Arg Thr Ala Gln Ala Gly Gln Gly Gly Met Arg Asn Leu Ser Phe Ser
 225 230 235 240
 Glu Val Ser Arg Asn Gly Gly Ile Ser Lys Pro Ala Glu Phe Gly Val
 245 250 255
 Asn Gly Ile Arg Val Asn Tyr Ile Cys Glu Ser Ala Ser Pro Pro Asp
 260 265 270
 Ile Met Val Leu Pro Thr Gln Ala Ser Ser Lys Thr Gly Lys Val Phe
 275 280 285
 Gly Gln Glu Phe Arg Glu Val
 290 295

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 <211> 221
 <212> PRT
 <213> Bacteriophage T4

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 20 25 30
 Lys Ser Phe Lys Ile Tyr Ser Glu Tyr Asn Lys Pro Gln Ala Ala Asp
 35 40 45
 Asn Asp Phe Val Ser Lys Ala Asn Gly Gly Thr Tyr Ala Ser Lys Val
 50 55 60
 Thr Phe Asn Ala Gly Ile Gln Val Pro Tyr Ala Pro Asn Ile Met Ser
 65 70 75 80
 Pro Cys Gly Ile Tyr Gly Gly Asn Gly Asp Gly Ala Thr Phe Asp Lys
 85 90 95
 Ala Asn Ile Asp Ile Val Ser Trp Tyr Gly Val Gly Phe Lys Ser Ser
 100 105 110
 Phe Gly Ser Thr Gly Arg Thr Val Val Ile Asn Thr Arg Asn Gly Asp
 115 120 125
 Ile Asn Thr Lys Gly Val Val Ser Ala Ala Gly Gln Val Arg Ser Gly
 130 135 140
 Ala Ala Ala Pro Ile Ala Ala Asn Asp Leu Thr Arg Lys Asp Tyr Val
 145 150 155 160
 Asp Gly Ala Ile Asn Thr Val Thr Ala Asn Ala Asn Ser Arg Val Leu
 165 170 175

Arg Ser Gly Asp Thr Met Thr Gly Asn Leu Thr Ala Pro Asn Phe Phe
 180 185 190
 Ser Gln Asn Pro Ala Ser Gln Pro Ser His Val Pro Arg Phe Asp Gln
 195 200 205
 Ile Val Ile Lys Asp Ser Val Gln Asp Phe Gly Tyr Tyr
 210 215 220

<210> 8
 <211> 1026
 <212> PRT
 <213> Bacteriophage T4

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 Thr Arg Pro Ala Ala Ser Val Leu Ala Glu Gly Glu Leu Ala Ile Asn
 20 25 30
 Leu Lys Asp Arg Thr Ile Phe Thr Lys Asp Asp Ser Gly Asn Ile Ile
 35 40 45
 Asp Leu Gly Phe Ala Lys Gly Gly Gln Val Asp Gly Asn Val Thr Ile
 50 55 60
 Asn Gly Leu Leu Arg Leu Asn Gly Asp Tyr Val Gln Thr Gly Gly Met
 65 70 75 80
 Thr Val Asn Gly Pro Ile Gly Ser Thr Asp Gly Val Thr Gly Lys Ile
 85 90 95
 Phe Arg Ser Thr Gln Gly Ser Phe Tyr Ala Arg Ala Thr Asn Asp Thr
 100 105 110
 Ser Asn Ala His Leu Trp Phe Glu Asn Ala Asp Gly Thr Glu Arg Gly
 115 120 125
 Val Ile Tyr Ala Arg Pro Gln Thr Thr Thr Asp Gly Glu Ile Arg Leu
 130 135 140
 Arg Val Arg Gln Gly Thr Gly Ser Thr Ala Asn Ser Glu Phe Tyr Phe
 145 150 155 160
 Arg Ser Ile Asn Gly Gly Glu Phe Gln Ala Asn Arg Ile Leu Ala Ser
 165 170 175
 Asp Ser Leu Val Thr Lys Arg Ile Ala Val Asp Thr Val Ile His Asp
 180 185 190
 Ala Lys Ala Phe Gly Gln Tyr Asp Ser His Ser Leu Val Asn Tyr Val
 195 200 205
 Tyr Pro Gly Thr Gly Glu Thr Asn Gly Val Asn Tyr Leu Arg Lys Val
 210 215 220
 Arg Ala Lys Ser Gly Gly Thr Ile Tyr His Glu Ile Val Thr Ala Gln
 225 230 235 240
 Thr Gly Leu Ala Asp Glu Val Ser Trp Trp Ser Gly Asp Thr Pro Val
 245 250 255
 Phe Lys Leu Tyr Gly Ile Arg Asp Asp Gly Arg Met Ile Ile Arg Asn

260												265				270					
Ser	Leu	Ala 275	Leu	Gly	Thr	Phe	Thr 280	Thr	Asn	Phe	Pro	Ser 285	Ser	Asp	Tyr						
Gly	Asn 290	Val	Gly	Val	Met	Gly 295	Asp	Lys	Tyr	Leu	Val 300	Leu	Gly	Asp	Thr						
Val 305	Thr	Gly	Leu	Ser	Tyr 310	Lys	Lys	Thr	Gly	Val 315	Phe	Asp	Leu	Val	Gly 320						
Gly	Gly	Tyr	Ser	Val 325	Ala	Ser	Ile	Thr	Pro 330	Asp	Ser	Phe	Arg	Ser 335	Thr						
Arg	Lys	Gly	Ile 340	Phe	Gly	Arg	Ser	Glu 345	Asp	Gln	Gly	Ala	Thr 350	Trp	Ile						
Met	Pro	Gly 355	Thr	Asn	Ala	Ala	Leu 360	Leu	Ser	Val	Gln	Thr 365	Gln	Ala	Asp						
Asn	Asn 370	Asn	Ala	Gly	Asp	Gly 375	Gln	Thr	His	Ile	Gly 380	Tyr	Asn	Ala	Gly						
Gly 385	Lys	Met	Asn	His	Tyr 390	Phe	Arg	Gly	Thr	Gly 395	Gln	Met	Asn	Ile	Asn 400						
Thr	Gln	Gln	Gly	Met 405	Glu	Ile	Asn	Pro	Gly 410	Ile	Leu	Lys	Leu	Val 415	Thr						
Gly	Ser	Asn	Asn 420	Val	Gln	Phe	Tyr	Ala 425	Asp	Gly	Thr	Ile	Ser 430	Ser	Ile						
Gln	Pro	Ile 435	Lys	Leu	Asp	Asn	Glu 440	Ile	Phe	Leu	Thr	Lys 445	Ser	Asn	Asn						
Thr	Ala 450	Gly	Leu	Lys	Phe	Gly 455	Ala	Pro	Ser	Gln	Val 460	Asp	Gly	Thr	Arg						
Thr 465	Ile	Gln	Trp	Asn	Gly 470	Gly	Thr	Arg	Glu	Gly 475	Gln	Asn	Lys	Asn	Tyr 480						
Val	Ile	Ile	Lys	Ala 485	Trp	Gly	Asn	Ser	Phe 490	Asn	Ala	Thr	Gly	Asp 495	Arg						
Ser	Arg	Glu	Thr 500	Val	Phe	Gln	Val	Ser 505	Asp	Ser	Gln	Gly	Tyr 510	Tyr	Phe						
Tyr	Ala	His 515	Arg	Lys	Ala	Pro	Thr 520	Gly	Asp	Glu	Thr	Ile 525	Gly	Arg	Ile						
Glu	Ala 530	Gln	Phe	Ala	Gly	Asp 535	Val	Tyr	Ala	Lys	Gly 540	Ile	Ile	Ala	Asn						
Gly 545	Asn	Phe	Arg	Val	Val 550	Gly	Ser	Ser	Ala	Leu 555	Ala	Gly	Asn	Val	Thr 560						
Met	Ser	Asn	Gly	Leu 565	Phe	Val	Gln	Gly	Gly 570	Ser	Ser	Ile	Thr	Gly 575	Gln						
Val	Lys	Ile	Gly 580	Gly	Thr	Ala	Asn	Ala 585	Leu	Arg	Ile	Trp	Asn 590	Ala	Glu						
Tyr	Gly	Ala 595	Ile	Phe	Arg	Arg	Ser 600	Glu	Ser	Asn	Phe	Tyr 605	Ile	Ile	Pro						

Thr Asn Gln Asn Glu Gly Glu Ser Gly Asp Ile His Ser Ser Leu Arg
610 615
Pro Val Arg Ile Gly Leu Asn Asp Gly Met Val Gly Leu Gly Arg Asp
625 630 635 640
Ser Phe Ile Val Asp Gln Asn Asn Ala Leu Thr Thr Ile Asn Ser Asn
645 650 655
Ser Arg Ile Asn Ala Asn Phe Arg Met Gln Leu Gly Gln Ser Ala Tyr
660 665 670
Ile Asp Ala Glu Cys Thr Asp Ala Val Arg Pro Ala Gly Ala Gly Ser
675 680 685
Phe Ala Ser Gln Asn Asn Glu Asp Val Arg Ala Pro Phe Tyr Met Asn
690 695 700
Ile Asp Arg Thr Asp Ala Ser Ala Tyr Val Pro Ile Leu Lys Gln Arg
705 710 715 720
Tyr Val Gln Gly Asn Gly Cys Tyr Ser Leu Gly Thr Leu Ile Asn Asn
725 730 735
Gly Asn Phe Arg Val His Tyr His Gly Gly Gly Asp Asn Gly Ser Thr
740 745 750
Gly Pro Gln Thr Ala Asp Phe Gly Trp Glu Phe Ile Lys Asn Gly Asp
755 760 765
Phe Ile Ser Pro Arg Asp Leu Ile Ala Gly Lys Val Arg Phe Asp Arg
770 775 780
Thr Gly Asn Ile Thr Gly Gly Ser Gly Asn Phe Ala Asn Leu Asn Ser
785 790 795 800
Thr Ile Glu Ser Leu Lys Thr Asp Ile Met Ser Ser Tyr Pro Ile Gly
805 810 815
Ala Pro Ile Pro Trp Pro Ser Asp Ser Val Pro Ala Gly Phe Ala Leu
820 825 830
Met Glu Gly Gln Thr Phe Asp Lys Ser Ala Tyr Pro Lys Leu Ala Val
835 840 845
Ala Tyr Pro Ser Gly Val Ile Pro Asp Met Arg Gly Gln Thr Ile Lys
850 855 860
Gly Lys Pro Ser Gly Arg Ala Val Leu Ser Ala Glu Ala Asp Gly Val
865 870 875 880
Lys Ala His Ser His Ser Ala Ser Ala Ser Ser Thr Asp Leu Gly Thr
885 890 895
Lys Thr Thr Ser Ser Phe Asp Tyr Gly Thr Lys Gly Thr Asn Ser Thr
900 905 910
Gly Gly His Thr His Ser Gly Ser Gly Ser Thr Ser Thr Asn Gly Glu
915 920 925
His Ser His Tyr Ile Glu Ala Trp Asn Gly Thr Gly Val Gly Gly Asn
930 935 940
Lys Met Ser Ser Tyr Ala Ile Ser Tyr Arg Ala Gly Gly Ser Asn Thr
945 950 955 960

Asn Ala Ala Gly Asn His Ser His Thr Phe Ser Phe Gly Thr Ser Ser
965 970 975
Ala Gly Asp His Ser His Ser Val Gly Ile Gly Ala His Thr His Thr
980 985 990
Val Ala Ile Gly Ser His Gly His Thr Ile Thr Val Asn Ser Thr Gly
995 1000 1005
Asn Thr Glu Asn Thr Val Lys Asn Ile Ala Phe Asn Tyr Ile Val Arg
1010 1015 1020
Leu Ala
1025